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ZOOLOGY.

Fresh-Water Sponges.—Maas[1] has studied the fresh-water sponge in Berlin. He describes the segmentation of the egg and the process of formation of the germ-layers. The latter exhibits some similarity to gastrulation in its broader features, and results in the formation of a closed cavity at one end of the oral germ. From the seemingly similar cells of this germ the ecto- meso- and entoderm are developed. The ectoderm is at first distinctly columnar. The mesoderm cells soon acquire a distinctly mesenchymal shape, and begin the formation of spicules before the appearance of the ampullæ. The entoderm appears to develop from the lining cells of the cavity of the germ, and consists of a flattened epithelium connecting here and there with globular anlage of the ciliated chambers. These latter sink further into the mesoderm, the flattened epithelium becoming drawn out to form efferent canals. The efferent openings are produced by a thinning of the ectoderm and a final breaking through. Maas did not see the process of formation of the osculum. Soon after the differentiation of the germ-layers the embryo (which has previously led a free life) loses its cilia and settles down, at the same time becoming flattened into a thin sheet. Connected with this, the ectoderm loses its columnar character and becomes flattened. Maas gives more proof —if more was needed—that Götte was wrong when he said that Spongilla loses its ectoderm during the process of development.

Notes on Earthworms.—In a paper,[2] devoted chiefly to descriptions of genera and species, Mr. F. E. Beddard prints some interesting points concerning earthworms. *Perichæta indica* is recorded from South America; it was previously known from the East Indies and New Caledonia. Perichæta, from its distribution, from its nephridial system and its circles of chætæ (Lankester's restriction of the term setæ is advisable), is regarded as the more primitive, and the bunches of chætæ in other earthworms are derived from this, rather than from the parapodia of some Polychæta. In the posterior part of the body of *Perichæta indica* are peculiar glands attached to the posterior sides of the septa on either side of the dorsal vessel. Somewhat similar septal glands occur in Acanthodrilus. Chemical tests seem to show the presence of glycogen in these organs,—and this in the epithelial cells, and not in the muscles as Barfurth thought. It also occurs in less quantity in the other peritoneal cells.

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[1] *Zeit. Wiss. Zool.*, L. Heft 4.

[2] Proc. Zool. Socy. London, 1890, p. 52.

Teredos in Telegraph Cables.—At a recent meeting of the Zoological Society of London attention was called to the fact that Teredos caused no little trouble to the managers of submarine cables off the Brazilian coast. These molluscs penetrate between the sheathing wires when in the embryonic stage, and then bore into the tanned jute, and even scoop out pieces from the gutta-percha sheathing of the conductor. Faults made by these Teredos are very difficult to locate, as they leave no external sign.

Scarcity of Oysters.—Owing to overdredging the oyster supply of the Chesapeake will be very small during the coming winter. The packing houses in Baltimore are finding it difficult to obtain supplies sufficient to keep them going at the rate of last winter. In 1888 and 1889 it was not unusual for the canning houses to steam 50,000 bushels a day, but this year the supply is at least fifty per cent. less. It does not need much of a prophet to point out that if the present overdredging be kept up for a few years longer the supply of Chesapeake oysters will be a thing of the past.

Hermaphroditic Anlage in Insects.—A very interesting and important article on the hermaphroditic anlage of sexual glands in *Phyllodromia* (*Blatta* L.) *germanica* has recently been published by Herr R. Heymons in the *Zoologischer Anzeiger*, August, 1890. The article contains only the most important results of Herr Heymons's investigations, which are to be published later in full. The investigations were carried on in the Berlin Zoological Institute, under the direction of Prof. F. E. Schulze, of Spongia fame.

Herr Heymons undertook to work out as carefully as possible the development of the sexual glands; and in the present incomplete state of our knowledge as to the origin and growth of these glands in insects such extended study with the aid of modern technic is very welcome. The first appearance of the sexual glands is of particular interest. Herr Heymons observed that the sexual cells have their origin chiefly in the walls of the cœlomic sacs. A smaller portion arises from the unsegmented mesoblastic layer, at a period before the primitive segments make their appearance. The author is undoubtedly correct in regarding this origin of the sexual cells from the walls of the body-cavity as an extremely primitive relation. It is interesting to note the correspondence with lower forms. In the Annelids, *e.g.*, the genital cells are also modified epithelial cells of the body-cavity, and this agreement adds unquestioned weight to the opinion that the insects stand in phylogenetic connection with the Annelids.

The genital anlage takes its origin from these genital cells together with certain smaller ones,—the "epethelial" cells of the entomologists. It is elongated and paired in both sexes, and lies either side of the intestine; the numerous egg-tubes which comprise the ovary of the female arise from these two cell-strands. With regard to the parts composing the ovarian tubes Herr Heymons does not agree with former authors. He states that the epithelial are of an entirely different origin from the eggs, whereas they were hitherto held to be of like origin,—at first an undifferentiated mass of cells, which afterwards gradually separate into egg and epithelial cells; and while the whole genital anlage of the females goes to form the ovarium, only a portion of the same is used in the male to build the testes. According to the investigations of Herr Heymons the origin of the sexual glands is alike in the male to that of the female already described: the two lateral cell-bands are formed, each of which is held in place by an "endfadenplatte." Both genital and epithelial cells are present. A large number of the latter lie on the ventral side of the organ, and give rise to the vas deferens. At a particular stage of the development the genital cells of the male group themselves at four points. These are first rudiments of the four follicles which compose each testis. Each genital anlange now contains two portions: (1) the four follicles, and (2) the genital and epithelial cells, which did not enter into the composition of the first, but which can be clearly seen between them. The follicles are connected with the vas deferens, which becomes shorter, and thus draws them out of the mass. The above-mentioned cells which were between the follicles are held in position by the "endfadenplatte," and represent, as Herr Heymons has most conclusively shown, *the rudiment of a female genital gland.* The further development of this organ is very variable in different individuals; details may be found in the paper itself. Of special interest is the fact that Herr Heymons found some cases in which the males possessed typical ovarian tubes with eggs and follicle, and that these were developed near the testes follicles. According to this the anlage of the male genital glands in the Phyllodromia must be regarded as hermaphroditic.

As the roaches are among the simplest and earliest insects, Herr Heymons draws the conclusion that the latter are probably descended from hermaphroditic forms.

Further particulars on the above-reviewed "preliminary," and of Herr Heymons's other investigations in this line, will be looked for with considerable interest.—C. W. STILES, *Leipzig, October, 1890.*

Studies on the Wrist and Ankle.—Dr. C. Emery[1] starts with Gegenbaur's morphological principle that the centrale must have had a primitively central position, and that where several centralia are present they form a connected group; but he rejects the views of Howes and Ridewood[2] that there may be a translocation of centralia to the radial and ulnar sides of the hand. He further accepts the views of Götle and Leboucq regarding the rays of the carpal and tarsal members. First he shows that in the hand of the larva of *Rana esculenta* traces of an intermedium are visible, and that the so-called centrale is a true centrale. Next he attacks the problem of the true nature of the so-called naviculare in the Anura. Comparing the carpus and tarsus of a frog, the similarity of the navicularia in both is apparent, but the naviculare tarsi is apparently, as Wiedersheim has pointed out, the tarsale of the prehallux; hence, says Emery, the so-called thumb of the frog must be a prepollex, or otherwise the prehallux must be hallux, and then the last fibular toe would be post minimus. He holds the former view. A larva of Pelobates with six toes is regarded as settling this point.

From this he turns to the existence of the prepollex in the Mammalia, and to Bardeleben's recent paper[3] on the foot of Pedetes. Similar bones to those described by Bardeleben as elements of the prepollex are known in other mammals, especially in the Rodentia. In other cases these structures are apparently ossifications of tendons. In the embryo of a rabbit Emery finds a true prepollex developed entirely independently of the fascia palmaris. This later migrates to the volar surface of the manus. This prepollex shows as many similarities with that of the Anura that Emery is not in doubt of their homology. Emery, however, regards the nail described by Bardeleben[4] on the prepollex of Pedetes as merely a horny growth. Bardeleben in turn[5] reaffirms his original statement, and quotes from a letter by Kohlbrugge, in which three specimens are mentioned with a true nail on this digit and a fourth with a horny cup. He also supports Bardeleben in his view of two phalanges in the prepollex of Pedetes.

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[1] *Anat. Anz.*, V., 283.

[2] Proc. Zool. Socy. London, 1888.

[3] Proc. Zool. Socy. London, 1889.

[4] *l. c.*

[5] *Anat. Anz.*, V., p. 321, 1890.

Skull of Sharks.—P. J. White has an account of the skull and visceral skeleton of the Greenland shark (*Læmargus microcephalus*) in the *Anatomischer Anzeiger*, V., No. 9. The cartilage is soft, and, except in the visceral arches, is without calcareous deposits. Among the peculiarities are the following: The neural arch of the first vertebra freely enters the foramen magnum; a canal (hypophysis canal?) runs through the cranial floor, opening near the foot of the pituitary fossa; a median cartilage intervenes between the extremities of the mandibular rami; there are other cartilages which may represent hypohyal elements; the first basibranchial is present,—it had only been known in Cestracion of the Elasmobranchs.

Dr. Leonard Stejneger on Bufo lentiginosus woodhousei.—In *Animal Life*, No. 3, p. 116, 1890, Dr. Stejneger, who is in charge of the department of reptiles in the Smithsonian Institution, writes as follows: "Prof. Cope, in his elaborate work on the 'Batrachia of North America,' as a reason for leaving Hallowell's *B. dorsalis* out of the synonymy, makes the following statement: 'There is nothing in the description nor the figure to enable us to ascertain what species or subspecies is represented. The evidence is as much in favor of the specimen having been a *B. l. americanus* as a *B. l. woodhousei*, and no locality is given to assist in reaching a conclusion.' This not so, for in the first place Hallowell gives the locality of the only specimen expressly as 'San Francisco Mountain, New Mexico' (*i.e.*, Arizona), and the second place mention is made of the shortness of the head ('Length of head, 8 lines; length of head and body, 3 inches,' consequently 'head 4.5 times in length'). Moreover, Girard, who afterwards examined and partly described the type specimen, simply changed the name because *B. dorsalis* was already preoccupied by Spix, and we are well warranted in regarding the only specimen brought home by Dr. Woodhouse as the type of *B. woodhousei*. Finally, the type of *B. dorsalis*, so far from not being found, is one of the very specimens enumerated by Prof. Cope, viz., No. 2531. The 'Calit Mountains' in the original entry on the museum record book is simply a slip for San Francisco Mountain, and is evidenced by the original parchment label still attached to the specimen, which reads: '*Bufo dorsalis*, Hallowell, San Francisco Mountain, New Mexico; S. W. Woodhouse, M.D.' This also disposes of another statement by the same author, that Möllhausen's specimen from the Canadian River (U. S. Nat. Mus., No. 2632) is the type. Girard at the time of publishing the name *B. woodhousei* had only the 'Sonoran' specimens from the U. S. Boundary Survey and Hallowell's type of *B. dorsalis ;* those from the Pacific R. R. Survey under Whipple came in later."

These statements imply a good deal of error somewhere, and it now devolves upon me show where it lies. In the first place, my statements as to the absence of anything " in the description or figure to enable us to ascertain what species or subspecies is represented " are strictly correct. As the character of the *B. l. woodhousei* is to have the head 4.5 to 5 times in the length, and of *B. l. americanus* is to have the head 4 to 4.5 times in the length, the statement by Hallowell that the head enters the length 4.5 times in the length does not help us in the least. And this is the only character cited by Dr. Stejneger. Nor does the locality help us, since *B. l. americanus* has been taken, according to Yanow, in Colorado, Utah, and New Mexico. These being the facts, *B. dorsalis* had to be relegated to the ignota until the type specimens could be found, and all names based on it had to lie in abeyance. The next specimen to which the name *B. woodhousei* was applied was that obtained by Möllhausen, and I therefore necessarily regarded that as the type. Had I followed a common precedent I would have sunk the name altogether, and used that of *B. frontosus* Cope, which applies to it.

However, Dr. Stejneger has now found the type in a specimen labeled as coming from the " California Mountains," a locality which I attempted in vain to discover when making out the list of specimens. It seems that this name is a " slip " for San Francisco Mountains. Dr. Stejneger discovers this by deciphering a parchment label which has soaked for some forty years in alcohol. This speaks well for the doctor's sight, for Hallowell's writing when fresh was generally nearly illegible !—E. D. COPE.

Notes on the Clawed Frog, Xenopus.—J. M. Leslie[6] has studied the habits of this South African frog. It lives on aquatic forms which it forces, into its mouth with its hands. It is apparently unable to eat out of water. Oviposition takes place in early spring (August), and the ova are deposited singly, and are attached to leaves or stones. The eggs at first measure one-sixteenth of an inch in diameter ; twenty-four hours later, after swelling of the mucilaginous envelope, they measure one-eighth of an inch. The fish-like larvæ acquire no external gills, nor are there any horny plates or teeth in the mouth. Material has been forwarded to Dr. Schlaninsland, who wishes to study the development.

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[6] Proc. Zool. Socy. London, 1890, p. 69.

Anatomy of Heloderma.—Dr. R. W. Shufeldt has a monograph[7] of the anatomy of this poisonous lizard, illustrated by three plates. Muscles and skeleton occupy most of the paper. No abstract is possible. Dr. Shufeldt does not decide as to the relationship of Heloderma, except in a negative way. He believes it but remotely related to the Varanidæ and Iguanidæ; so too with Lanthanotus and Crotaphytus. On the other hand, he believes that a study of Xantusia, Xenosaurus, and Lepidophyma will throw much light on these points. He does not appear to notice the fact that the question was settled by Cope, so long ago as 1866, so far as the osteology is concerned.

Birds.—Beddard concludes[8] that Psophia is nearest in osteological characters to the Cariamidæ, with resemblance to Œdicnemus, Grus, and Rhinochetus, and on the whole that it comes nearest the cranes. Grus seems to be the central from which radiate the Limicolæ, Rhinochetus, and the Ardeidæ, and the Rallidæ, Œdicnemus, Psophia, Cariama, and Gypogeranus.

The Name of the Kangaroo.—At a recent meeting of the Linnean Society of New South Wales[9] some discussion took place as to the meaning of the now universally accepted term kangaroo. It appears that it has been reported that in the language of the natives of the Endeavour River region the word kangaroo means "I don't know." This answer was given to Captain Cook in reply to some question, and he instead of appreciating its meaning, understood it to be the name of the animal to which it is universally applied.

Possible Occurrence of the Wolverine in Ohio.—While botanizing in Sugar Grove, Fairfield Co., Ohio, a citizen of the town told me that about Oct. 1, 1890, he had seen an animal descending a tree head downward. He described the animal as follows: "About the size of a large domestic cat, with rather long and very bushy tail, of dark color, striped on back like a chipmunk." I should judge from the description that the animal must have been a wolverine (*Gulo luscus* L). I know of no case on record of its occurrence in Ohio since 1842. Has any one seen it since that date? or is there some other animal that would answer the description?—E. V. Wilcox, *Columbus, Ohio.*

[7] Proc. Zool. Socy. London, 1890, p. 148.

[8] Proc, Zool. Socy. London, 1890, p. 329.

[9] *Zool. Anz.*, XIII., p. 564.